





UNITED STATES AIR FORCE

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ELECTRONIC PRINCIPLES

AIR FORCE MILITARY TRAINING CENTER (AFMTC)

AFSC 30650

AFPT 90-EPI-825

FEBRUARY 1990

OCCUPATIONAL ANALYSIS PROGRAM
USAF OCCUPATIONAL MEASUREMENT CENTER
AIR TRAINING COMMAND
RANDOLPH AFB, TEXAS 78150-5060

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PREFACE

This report presents the results of an Air Force Electronic Principles survey of AFSC 30650, Electronic Communications and Cryptographic Equipment Systems Specialist. Authority for conducting Electronic Principles (EP) surveys is contained in AFR 35-2.

Results presented in this report are part of an EP survey of 81 Air Force specialties. This survey was requested by the Chief, Common Electronics Training Program (CETP) Program Management Team (PMT) in October 1985.

The Electronic Principles Inventory (EPI) used to collect EP survey data was originally developed in 1976 by Dr Hendrick Ruck and Major Thomas O'Connor. Mr Theodore Wilcox revised and validated the EPI in 1986 as part of this survey project.

First Lieutenant Robert Hampel analyzed the data and wrote the final report. Computer programming support was provided by Ms Olga Velez and Mr Wayne Fruge, and Ms Raquel A. Soliz provided administrative support. This report was reviewed and approved by Mr Gerald Clow, Chief, Management Applications Branch, Occupational Analysis Division, USAF Occupational Measurement Center.

This report is distributed to Air Staff sections, major commands, and other training and management personnel. Requests for additional copies should be sent to Chief, Occupational Analysis Division (OMY), USAF Occupational Measurement Center Randolph AFB, Texas 78150-5000.

BOBBY P. TINDELL, Colonel, USAF Commander USAF Occupational Measurement Center JOSEPH S. TARTELL Chief, Occupational Analysis Division USAF Occupational Measurement Center

REPORT SUMMARY

- 1. <u>BACKGROUND</u>: This report provides data on electronic principles (EP) used by DAFSC 30650 personnel. This data provides insight on EP training needs for 306XO personnel.
- 2. <u>METHODOLOGY</u>: The USAF Electronic Principles Inventory (AFPT 90-EPI-825, June 1987) was administered to a randomly selected sample of fully qualified job incumbents in DAFSC 30650. The data were collected from September 1987 to April 1988.
- 3. <u>RESULTS</u>: Complete survey data is provided in three appendices. A "generic" version of the Electronic Fundamentals/Applications (EF/A) is used in Appendix B--complete analysis requires the use of 30650 proficiency codes, rather than the generic set used in the Appendix. The POI for course L3ABR30630 was largely supported by survey data. Survey data showed 69 EPI items not referenced to the POI that were used by at least 30 percent of the sample. These items should be considered for inclusion into the POI. Following is a list of all appendices:

Appendix A: 30650 EP data in EPI job inventory order

Appendix B: 30650 EP data matched to Electronic

Fundamentals/Applications (EF/A) STS

Appendix C: 30650 EP data matched to POI L3ABR30630,

dated 22 September 1986

4. <u>DISCUSSION</u>: This EP survey data shows the operational use of electronic principles by fully qualified, worker-level job incumbents in the 306X0 specialty. Presently, there is no specific regulatory guidance on the use of EPI survey data; however, this data does provide insight into the EP training requirements for 306X0 personnel.

ELECTRONIC PRINCIPLES SURVEY REPORT DAFSC 30650

INTRODUCTION

From missile systems maintainers to telephone switching specialists, from avionics technicians to biomedical equipment personnel, the U.S. Air Force employs more than 50,000 worker-level (primarily 5-skill level) personnel who require electronic principles (EP) training. These highly skilled, technically trained airmen work in over 80 Air Force specialties (AFSs) spanning 11 career fields. Furthermore, the depth and breadth of required EP training varies based on specialty needs. In short, the USAF spends vast amounts of money, manpower, and time to ensure that airmen are properly trained in electronic principles.

To make the best use of these resources, the USAF Common Electronics Training Program (CETP) was designed to consolidate and standardize Air Force EP training where possible and practical. This is primarily accomplished through special EP courses taught at four USAF Technical Training Centers (TTCs). These EP courses teach the electronic principles common to two or more AFSs. Another part of the CETP is the development of common training modules. Specific blocks of EP instruction are developed by one TTC, then shared with the other TTCs which teach that EP subject. By selectively combining and standardizing Air Force EP training, the USAF makes best use of limited training resources.

Not all Air Force electronic principles training is conducted in special EP courses, however. For example, some EP subjects are used in only one AFS. Students learn these generally advanced topics in AFSC-awarding courses, building on the more basic EP subjects from the common EP course. Also, some AFSs require very few electronic principles, and airmen in these specialties receive EP training only in their AFSC-awarding courses.

As with other Air Force technical training, EP training programs can profit from objective analysis of specific training requirements. These requirements can be analyzed objectively using occupational survey data. This EP survey provides data which can be used to analyze the specific EP training requirements in CETP courses and AFSC-awarding courses alike. The instrument used to collect EP survey data is the Electronic Principles Inventory (EPI).

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BACKGROUND

The USAF Electronic Principles Inventory (EPI) is a knowledge- and skills-based job inventory which identifies the electronic principles, skills, and equipment an airman uses in the performance of his or her job.

The EPI was originally developed by Dr Hendrick Ruck and Major Thomas O'Connor in 1976. An in-depth discussion of the original concept, development, and validation of the EPI can be found in USAFOMC Technical Note 77-02, "The Development and Application of the Electronic Principles Job Inventory". Mr Theodore Wilcox revised and validated the EPI in 1986 for this survey.

The EPI contains two sections. First is a background section containing demographic and job satisfaction questions. The second section contains 712 electronic principles, skills, and equipment questions covering 39 EP subject areas. Below are some example questions taken from the EPI. The 39 EPI subject areas are listed in Table 1.

After completing the background section, job incumbents respond "Yes" or "No" to the 712 EPI questions. The result is a "profile" of electronic principles, skills, and equipment used by the incumbent in his or her present job. This electronic principles "profile" can be combined with the "profiles" of other job incumbents to produce a "profile" for the entire AFS.

EXAMPLE EPI QUESTIONS

Example Principles Questions

A4-4	Do you use electron tube characteristic curves?
G1-20	Do you use parity bit codes?
H4-33	Do you use "FM" modulation principles?

Example Skills Questions

C1-8	Do you calculate values of transistor amplifier voltage,
	current, or power gain?
E2-1	Do you trace schematic or block diagrams of circuits
	containing frequency sensitive filters?
I1-4	Do you measure RF effective power?

Example Equipment Questions

B4-2 D3-5	Do you use spectrum analyzers? Do you perform tasks on variable resistor voltage
	regulators?
J1-8	Do you work on dynamic microphones?

TABLE 1 EPI SUBJECT AREAS

SUBJECT AREA NUMBER	SUBJECT AREA TITLE
A1 A2	Direct/Alternating Current Electro/Mechanical Devices
A3	Solid-State Circuits and Devices
A4	Tubes
A5	Soldering or Solderless Connections
B1	Multimeters
B2	Oscilloscopes
В3	Signal (Function) Generators
B4	Test Equipment
C1	Transistor Amplifier Circuits
C2	Transistor Amplifier Stabilization Circuits
C3	Coupling Circuits
C4	Electron Tube Amplifier Circuits
C5	Operational Amplifiers
C6	Magnetic Amplifiers
D1	Power Supply Circuits
D2	Power Supply Filters
D3	Power Supply Voltage Regulators
E1	Resistive Capacitive Inductive Circuits
E2	Frequency Sensitive Filters
F1	Oscillators
F2	Multivibrators
F3	Waveshaping Circuits
F4	Limiter/Clamper Circuits
G1	Digital Logic Numbering Systems and Functions
G2	Computers
G3	Digital Circuits
G4	Digital to Analog (D/A) and Analog to Digital (A/D) Converters
H1	Connections (Transmission Lines and Waveshaping Circuits)
H2	Microwave Oscillators and Amplifiers
Н3	Resonant Cavities
H4	Transmitters and Receivers
Н5	Antennas
I1	Radio Frequency Measurements
I2	Radio Frequency Calculations
J1	Microphones and Speakers
J2	Photosensitive Devices
J3	Storage Type Display Tubes
J4	Television, Laser, and Infrared Systems

SURVEY ADMINISTRATION

As mentioned in the PREFACE, data were collected for this survey from over 80 AFSs (78 AFSs, 3 Reporting Identifiers). Survey data were collected in four increments, from March 1987 through March 1989. A total of 24,651 EPI booklets were mailed to active duty airmen worldwide. After each of the first three increments, interim survey reports were published by USAFOMC. These reports are all numbered AFPT 90-EPI-825, and are dated July 1988 (EPI-1), January 1989 (EPI-2), and February 1989 (EPI-3). There was no separate report of data collected in EPI-4. Results were combined with those of the first three increments to produce the final reports. There are a total of five final EPI reports, one for each of the following: Chanute TTC, Keesler TTC, Lowry TTC, Sheppard TTC, and the Air Force Military Training Center (AFMTC) located at Lackland AFB. This report presents results only for DAFSC 30650, Electronic Communications and Cryptographic Equipment Systems Specialist.

Survey administration for 30650 was from September 1987 through April 1988. Of 1,313 DAFSC 30650 personnel assigned, 987 were eligible to take the survey; that is, they had at least 4 weeks' experience in their job, and were not within 90 days of retirement nor expecting reassignment within 60 days. A random sample of 377 was selected, and booklets were mailed to 30650 airmen worldwide. All useable EPI booklets that were returned to USAFOMC were included in the final sample, which numbered 235.

RESULTS

Each completed EPI survey booklet shows which electronic principles the respondent uses in his or her present job. When the responses of all survey respondents from a specific group are combined, the results are shown as percent of group members using each of the 712 EP items. Complete survey results are listed in Appendix A, which shows the percent of sample members responding "Yes" to each of the 712 EPI items.

Collectively, 30650 personnel used 662 of the 712 EPI items. However, the highest number of EPI items used by any 30650 survey respondent was 446, while the person who used the least number of EPI items used only eight. On the average, 30650 sample members used 174 of the 712 EPI items.

Training Analysis

One of the primary reasons for collecting EPI data is to determine the EP training needs of Air Force personnel, and consequently, how well USAF technical training supports those needs. To this end, subject-matter experts (SMEs) matched EPI items to appropriate block(s) of the Electronic Fundamentals/Applications (EF/A) part of the Specialty Training Standard (STS), known as the STS Attachment 2.

For this study, a "generic" version of the EF/A STS was used for the match—that is, all blocks of the EF/A were matched, and the proficiency codes are NOT specific to the 306X0 STS. Still, this match of EPI items to the EF/A STS can be used to determine which blocks of the STS Attachment 2 should be included in the 306X0 STS, and should be reviewed for this purpose. The match of EPI items (with corresponding survey data) to the "generic" EF/A STS is located in Appendix B of this report.

Subject-matter experts also match EPI items to Plans of Instruction (POIs) for Air Force courses which teach electronic principles. Once the EPI items are matched to the appropriate POI block(s), the percent of group members responding "Yes" to those matched items can show how well the particular block of instruction is supported. For example, if many group members respond "Yes" to the EPI items matched to a block of instruction, then that block is considered well supported by survey data. If, however, few group members respond "Yes", this indicates little support for the POI block under consideration.

For this study, SMEs matched the 712 EPI items to the POI for course L3ABR30630, dated 22 September 1986. This match (with 30650 survey data) is shown as Appendix C of this report. The first section shows the EPI items matched to the POI, while the second section shows the EPI items which were not referenced to any POI block.

Most of the POI was supported by survey data. In fact, only one section (Block I, Item 1a) is recommended for review due to low percent members responding "Yes". Furthermore, 69 EPI items not referenced to the POI had at least 30 percent of sample members responding "Yes". Examples of these unreferenced items are included in Table 2, and the complete listing can be found in Appendix C under "TASKS NOT REFERENCED". These 69 items should be considered for inclusion into the EP section of the course.

TABLE 2

EXAMPLE EPI ITEMS NOT REFERENCED TO POI WITH AT LEAST 30 PERCENT OF DAFSC 30650 MEMBERS RESPONDING YES

T. 01/ 1	HINGER (TACK TITLE	PERCENT MEMBERS
IASK N	NUMBER/TASK TITLE	RESPONDING "YES"
A5-06	Do you use crimping tool to repair or make	
	connections	88
B4-01	Do you use frequency counters	83
A1-16		
	relay	78
A5-10	Do you repair or fabricate connectors or cables on	
	coaxial cables	72
A5-07	Do you use wire wrap tool to make connections	71
A5-09		
	multiconductor cables	70
F1-03	Do you troubleshoot to isolate a faulty oscillator	•
	circuit	65
F1-04	Do you troubleshoot oscillators to circuit level	
	components	59
A1-19	Do you continuity check relays	58
F2-04		
	components	56
A1-18	Do you perform tasks on contacts, cores, coils,	
	armatures, or springs	43
A1-25	Do you calibrate or adjust circuits by using	
	variable inductors	43
A1-32	Do you calibrate or adjust circuits using variable	
	capacitors	43
C1-06	Do you adjust or align transistor amplifiers	38
G4-03		36
B3-09		33
G3-23	Do you perform tasks on comparators	32

DISCUSSION

ATC Regulation 52-22 provides direct and specific guidance on the use of occupational survey data in the development of Specialty Training Standards and centralized training programs; however, the guidelines deal with the use of task data, not principles data. Concerning electronic principles, the regulation states only that "EPI studies provide valuable information for curriculum development or validation in terms of percent members requiring a range of electronics principles knowledge in the performance of their job." Though there are no hard and fast rules for using EPI data, training personnel should consider EPI survey results when developing or refining EP training program content.

Following is a summary of the Appendices:

Appendix A: 30650 EP data in EPI job inventory order

Appendix B: 30650 EP data matched to Electronic

Fundamentals/Applications (EF/A) STS

Appendix C: 30650 EP data matched to POI L3ABR30630,

dated 22 September 1986

As mentioned throughout this report, the data contained in these appendices show the use of EP data by 30650 personnel, and consequently provide insight into the EP training needs of airmen in the Electronic Communications and Cryptographic Equipment Systems specialties (AFSC 306X0).

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Program	PRIMOD	PRTHOD	PRTHOD
Report Element Program Title	RP0011	RP0012	RP0013
Report		٧.	m.

Order)	
(Inventory Order	
Data	
EPI	
: 30650 EPI Data	
DAFSC	
PRTHOD	

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Report Option Table for Modules

PM0010

Primary Sort Inventory Sequence Secondary Sort Not Used Print Suppress Not Used

Status

Option

Report Option Table for Tasks

Option Status
Primary Sort Inventory Sequence
Secondary Sort Not Used
Print Suppress Not Used

Description of Reported Module Factors

1 1 1	Min Valid	
Range	Hin	
Tasks Within	Mean S.D. Max	
f on All	S.D.	
Based on All Tasks Within Range	Mean	
Number	Members	
	tor Title	Module Statement
	Col Factor Source vector	
	Factor	TITLE
	Col	-

Description of Reported Task Factors

	Valid	712
		.00
Based on All Tasks Within Range	Max	97.45
d on All	S.D.	25.37
Base	Mean	24.48 25.37 97.45
Number	Members	235
	Title	Task Statement All DAFSC 30650
	Source vector	GP0089/PMP
	Col Factor	TITLE F0083
	Col	4 2

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Inventory 0
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30650 EPI
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Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in job inventory order. Data for this report was collected from job incumbents during the period September 1987 - April 1988

Percent members responding "YES" is shown for each specialty listed.

For assistance in using this EPI printout phone USAFONC/OHYA, at AUTOVON 487-6811.

306 50 Task Title T Tsk Y Nbr

EPI Electronic Principles Inventory 0001 General Electronic/Electricity 0005

Al Direct/Alternating Current 11. 0003

~	-	Al-1 Do you use metric terms (example mili, kilo, mega)	73
~	7	Al-2 Do you use basic DC electrical/electronic terms	44
<	M	Al-3 Do you use basic AC electrical/electronic terms	95
4	4	Al-4 Do you trace schematic or block diagrams of circuits	93
		containing conductors, fuses, lamps, switches, or batteries	
<	S	Al-5 Do you troubleshoot circuits containing conductors,	96
		fuses, lamps, switches, or batteries	
<	9	Al-6 Do you calculate values of DC voltage, current, resist-	45
		ance, or power	
<	7	Al-7 Do you calculate values of AC effective voltage,	45
		average voltage, or peak-to-peak voltage	
4	80	Al-8 Do you calculate values of frequency, phase	46
		relationship, or wave length	
<	6	Al-9 Do you trace schematic or block diagrams of circuits	89
		containing resistors	
~	10	Al-10 Do you troubleshoot circuits to isolate a faulty	84
		resistor	
•	11	A1-11 Do you calibrate or adjust circuits by using	83
		variable resistors	
~	12	Al-12 Do you calculate the value of a resistor required	48
		for a circuit	
<	13	Al-13 Do you determine ohmic value of a resistor using	75
		the color code	
<	A 14	Al-14 Do you ohm check resistors	83

PM0010

DAFSC 30650 EPI Data (Inventory Order)

PRTMOD

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c Task Title	Al-15 Do you trace schematic or block diagrams of circuit	⋖	relay 7 Al-17 Do vou adjust relays	A1-18 Do you		9 A1-19 Do you continuity check relays 1 A1-20 Do you trace schematic or block diagrams of circuits	containing inductors, chokes, or choke coils	Al-21 Do you troublesho	inductor, choke, or choke coil 2 Al-22 Do vou calculate values of circuit total inductance	A1-23 Do you calculate values of circuit or con	inductive reactance	current in circuits containing inductors	A1-25 Do	inductors		circuits containing capacitors	⋖	capacitor 0 Al-29 No von calculate values of circuit total capacitanse	Al-30 Do you calculate values of circuit or com	capacitive reactance	Al-31 Do you calculate	voltage or current in circuits containing capacitors 2 Al-32 Do vou calibrate or adjust circuits using variable	capacitors	⋖	Al-34 Do you use capaci	job 5 - Al-35 Do vou trace schematic or block diagrams of circuits	containing transformers	⋖	transformer 7 Al-37 Do vou calculate transformer voltage or current	step-up or step-down ratios	Al-38 Do you calculate impedance	⋖	Transformers Maintenance of the chack transformers	Al-41 Do you	Al-42 Do you	containing three phase transformers	three phase transformer	Al-44 Do you adjust three phase transformers	•
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∢	45	A2-1 Do you trace schematic or block diagrams of	23
∢	46		23
4	47	DC motor 42-3 Do voi troiblechoot DC motor component parts	2
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4	43	A2-5 Do you trace schematic or block diagrams of circuits containing AC motors	23
A 5	20	you	22
4	5	motor Ap-7 Dr Amerika school Af colors commenced monde	
4 4	1 C	AZ-7 Do you troubleshoot AC motor component parts A2-8 Do you parform tasks on AC motor component parts	11
, v1	53	Do you trace schematic or block o	- -
		containing DC generators	•
√	5 4	A2-10 Do you troubleshoot to isolate a faulty DC generator	3 3
., M	50.0	Do you perform tasks on component parts of	. 4
•	7	generators	3
<	ò	Containing AC generators	-
₹	58	A2-14 Do you troubleshoot circuits to isolate a faulty	•
4	59	AC generator A2-15 Do vou troubleshoot AC denerator component parts	
. 4	09	A2-16 Do you perform tasks on component parts of AC	· m
•	19	generators A2-17 Do you trace schematic or block diagrams of circuits	8
		containing alternators	
∢	6 2	A2-18 Do you troubleshoot circuits to isolate a faulty alternator	
9	63	A2-19 Do you troubleshoot alternator component parts	1
9	59	Do you perfor	
4	65	A2-21 Do you trace schematic or block diagrams of circuits	_
4	99	containing synchros of servos A2-22 Do you troubleshoot circuits to isolate a faulty	2
		synchro or servo	
4 •	19	A2-23 Do you troubleshoot synchro or servo component parts	.
<	0	AC-C4 DO YOU PELTOTE (ASKS OF COMPONENT PARTS OF SYNCHOS OF SERVOS	Þ
9	69	A2-25 Do you trace schematic or block diagrams of circuits	2
•	7.0	containing choppers	
	•	faulty chopper	4
< ·	17.	ssure chopper coil	
` «	72	A2-28 Do you measure chopper coil voltage-current phase relationshio	-
4		7 -	

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A 151	A5-11 Do you repair or fabricate connectors or cables on	31
A 152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables	30
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6000	II 1. Bl Multimeters	
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B 157	the multimeter to measure AC	70
067 0	external shunts	**
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0043 IX. Radio Frequency (RF) Measurements or Calculations

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Measurement
RF P
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R	RF	RF	R	Ŗ
measure	measure	measure	measure	measure
2	30	70/	70/	70/
9	9	8	8	g
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069 C	J3-1 Do you trace block diagrams of circuits containing	0	
169 C	distribution to the schematic diagrams of display tubes or circuits	•	
269 f	13-3 Do you troubleshoot to isolate a faulty display tube	0 (
769 F		, .	
7 695 J 696	J3-6 Do you work on multiple mode storage tubes (MMST) J3-7 Do you work on scan converter tubes (SCT)	•••	
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769 C	J4-1 Do you trace block diagrams of TV systems or	•	
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Report Option Table for Modules

Option Status
Primary Sort Inventory Sequence
Secondary Sort Not Used
Print Suppress Not Used

Report Option Table for Tasks

Option Status
Primary Sort Inventory Sequence
Secondary Sort Not Used
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Description of Reported Module Factors

Valid ----- Based on All Tasks Within Range
Mean S.D. Max Min Hean Number Members Module Statement Source vector Title Col Factor 1 TITLE

Description of Reported Task Factors

Valid 712 ----- Based on All Tasks Within Range
Mean S.D. Max Min 00. 97.45 25.37 24.48 Number Members 235 Task Statement All DAFSC 30650 Source vector Title GP0089/PMP Col Factor 1 TITLE 2 F0083

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Electron special Data for period	Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in Electronic Fundamentals/Applica Data for this report was collected from job incumbents during the period September 1987 - April 1988	ata for Air Force ronic fundamentals/Applicatons order. job incumbents during the		
Percen	Percent members responding "YES" is shown for each specialty listed	cialty listed.		
For ass	For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6811.	С/ОНҮА,		
D T TSK Y Nbr	Task Title	306 50		
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0003	la. Metric Notation B			_
A 1	Al-1 Do you use metric terms (example mili, kilo, mega)	lo, mega) 73		
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A	Al-2 Do you use basic DC electrical/electronic terms	terms 97		
0005	lc. AC Terns	, 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1	
m «	Al-3 Do you use basic AC electrical/electronic terms	terms 95		
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4	Al-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries	93			
0000	2b. Troubleshoot circuits 2b		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		:
∀	Al-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries	56			
6000	3. Basic Circuit Calculations				:
0010	3a. DC				:
A 6	Al-6 Do you calculate values of DC voltage, current, resistance, or power Al-12 Do you calculate the value of a resistor required for a circuit	45			
0011	3b. AC		; ; ; ; ; ; ; ; ; ;		ŀ
~ 	Al-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage Al-8 Do you calculate values of frequency, phase relationship, or wave length	45			
0012	4. Resistors			 	:
0013	4a. Theory of operation				;
6 ◀	Al-9 Do you trace schematic or block diagrams of circuits containing resistors	68			

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A 11	Al-11 Do you calibrate or adjust circuits by using variable resistors	68 33			
0014	4b. Isolate faulty resistors			! ! ! ! !	:
A 10	Al-10 Do you troubleshoot circuits to isolate a faulty resistor	98 & 7			
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A 13	Al-13 Do you determine ohmic value of a resistor using the color code	75			
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A 15 A 17 A 18	Al-15 Do you trace schematic or block diagrams of circuits containing relays Al-17 Do you adjust relays Al-18 Do you perform tasks on contacts, cores, coils, armatures, or springs	79 41 43			
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A 16	Al-16 Do you troubleshoot circuits to isolate a faulty relay Al-19 Do you continuity check relays	78 58			
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A 77 A	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids A2-35 Do you perform maintenance on solenoid component parts	ts 4			

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A 78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid	7		
0021	6. Inductors			
0022	6a. Theory of operation B			1 1 1 1 1
A 20	Al-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils Al-25 Do you calibrate or adjust circuits by using variable inductors	67		
0023	6b. Isolate faulty inductors 2b			
A 21	Al-21 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil Al-26 Do you ohm check inductors	6.5		
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A 23 A 23 A 24	Al-22 Do you calculate values of circuit total inductance Al-23 Do you calculate values of circuit or component inductive reactance Al-24 Do you calculate values of circuit voltage or current in circuits containing inductors	23 21 26		

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0027	7b. Isolate faulty capacitors 2b		;
A 28	A1-28 Do you troubleshoot circuits to isolate a faulty	83	
A 33	2	78	;
0028	7c. Calculations		
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0030	8. Transformers		
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A 35	Al-35 Do you trace schematic or block diagrams of circuits containing transformers Al-39 Do you calibrate or adjust circuits using variable transformers	86 25	

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4.5	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors	23	

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0129	29b. Isolate faulty tube amplifiers	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		!
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0130	29c. Troubleshoot circuits		1 1 1 1 1 1 1	! !
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C 250	C5-2 Do you troubleshoot to isolate a faulty op amp circuit	0.4				
0134	31. Magnetic Amplifiers				1	!

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0136	31b. Isolate faulty magnetic amplifiers				;
C 267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	m			
0137	31c. Troubleshoot circuits		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1	:
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0140	32b. Isolate faulty saturable reactors	, , , , , , , , , , , , , , , , , , ,	0 6 6 1 1 1 5 6 6 6 6 7 7 7 7 7 7 7 7	, , , , ,	:
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0143	33a. Theory of operation			
0144	33a(1). Rectifiers (Half-wave, Full-wave, B Full-wave bridge)			
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2b
D1-3 Do you troubleshoot circuits to isolate a faulty
D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter
2b
supplies to circuit
supply filters to circuit
Series EVR,
8
D3-1 Do you trace block diagrams of circuits containing
tors diagrams of power supply
variable resistor power
zener diode ромег supply
transistor series power supply
IC power supply voltage
pulse width modulator ors

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0159	36b. Isolate faulty frequency sensitive 2b filters			; 1 1 1 1	:
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0176	39c. Troubleshoot circuits	1			:
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J 682	processistive devices J2-2 Do you trace schematic diagrams of photosensitive device circuits	м			
7 684	2	 1			
J 685	J2-5 Do you work on photodiodes J2-6 Do you work on phototransistors	m «			
	Do you work on phototubes	10			
989 r	JZ-8 Do you work on photo-SCKs J2-9 Do you work on photocells (Photoconductive or	9 4			
	itaic)				
0261	57b. Isolate faulty photosensitive 2b devices	1	1	; ; ; ;	!
J 683	J2-3 Do you troubleshoot to isolate a faulty photo-sensitive device	ю			
0262	58. Display Tubes	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	; ! ! !	:

52		1			}		:	! !	! !	:	!	
9 6 8					1					 		
Occupational Analysis Program USAFOMC (ATC) Randolph AFB TX										1		
	306 50				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	•				1 1 6 1 4 1	 	54 17 19 9 7 7 33
DAFSC 30650 EPI Data Matched to EF/A STS PH0011	Task Title	58a. Theory of operation	J3-1 Do you trace block diagrams of circuits containing display tubes J3-2 Do you trace schematic diagrams of display	tubes or circuits J3-4 Do you adjust or calibrate display tubes or circuits J3-5 Do you work on direct view storage tubes (DVSI) J3-6 Do you work on multiple mode storage tubes (HMSI) J3-7 Do you work on scan converter tubes (SCI)	58b. Isolate faulty display tubes	J3-3 Do you troubleshoot to isolate a faulty display tube	59. Support Subjects	59a. Safety applicable to electronics B	59b. First aid for electrical shock B	trostatic Discharge	Tasks not referenced	B3-4 Do you use audio sine-wave signal generators B3-5 Do you use audio non-sinusoidal signal generators B3-6 Do you use RF less than 1,000MH signal generators B3-7 Do you use RF greater than 1,000MH signal generators B3-8 Do you use white noise signal generators B3-9 Do you use pattern signal generators
PRTHOD	D T Tsk Y Nbr	0263	J 690	1 693 1 694 1 695 1 695	0264	J 692	0265	0266	0267	: : eo	0269	B 175 B 176 B 177 B 178 B 179

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Report Option Table for Modules

Option Status
Primary Sort Inventory Sequence
Secondary Sort Not Used
Print Suppress Not Used

Report Option Table for Tasks

Option Status
Primary Sort Inventory Sequence
Secondary Sort Not Used
Print Suppress Not Used

Description of Reported Module Factors

Valid ----- Based on All Tasks Within Range Mean S.D. Max Min Mean Number Members Module Statement Source vector Title Col Factor TITLE

Description of Reported Task Factors

Valid 712 ----- Based on All Tasks Within Range
Mean S.D. Max Min **0**. 97.45 25.37 24.48 Number Members 235 Task Statement All DAFSC 30650 Col Factor Source vector Title GP0089/PMP 1 TITLE 2 F0083

PRTMOD	DAFSC 30650 EPI Data Matched to POI L3ABR30630 002 PM0012	Occupational Analysis Program Page USAFOMC (ATC) Randolph AFB TX	α
Electro special order. period	Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in matched to POI L3ABR30630, dated 22 Sep 86 order. Data for this report was collected from job incumbents during the period September 1987 - April 1988		
Percent	Percent members responding "YES" is shown for each specialty listed.		
For ass at AUTO	For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6811.		
D T Tsk Y Nbr	306 Task Title		
0001	POI L3ABR30630 002 ELECTRONIC CRYPTOGRAPHIC COMMUNICATIONS EQUIPMENT SPECIALIST Dated 22 Sep 86 AIR FORCE MILITARY TRAINING CENTER	-	
0005	0002 I. DC Circuits		
0003	I 1. Orientation		
4000	I la. Be briefed on applicable portions of ZZI 0040. STS: None Meas: None		1

0006 I 2a. Using powers of ten, slove for the unknown value, with 3 out of 5 correct. STS: 19a Meas: W

0005 I 2. Operation

PRIMOD DAFSC 30650 EPI Data Matched to POI L3ABR30630 002 PM0012 D T Tsk Y Nbr Task Title	Occupational Analysis Program Page 3 USAFOMC (ATC) Randolph AFB TX 316 50
I 2b. Given numerical values, convert them to selected metric prefixes, with 3 out of 5 correct.	
Al-1 Do you use metric terms (example mili, kilo, mega)	73
I 3. DC Circuits	
I 3a. Given 10 representations of differences of potential, draw the direction of currect flow, with 7 out of 10 correct. STS: 19a Meas: W	
Al-2 Do you use basic DC electrical/electronic terms	26
I 3b. Given 5 resistors, identify the ohmic value of each using the color, with 4 out of 5 correct. STS: 19a Meas: W	, , , , , , , , , , , , , , , , , , ,
Al-1 Do you use metric terms (example mili, kilo, mega) Al-13 Do you determine ohmic value of a resistor using the color code	73 75
I 3c. Given 5 resistors, use the multimeter measure the obmic value of each + or - 10%, with 4 out of 5 correct, with a maximum time of 15 minutes. STS: 18a, 18b(2), 7c(1) Meas: P	
Al-14 Do you ohm check resistors Bl-7 Do you use the multimeter to measure circuit resistance Bl-8 Do you use the multimeter to measure component	83 74 85
resistance B4-4 Do you use digital multimeters	95

PRIMOD	DAFSC 30650 EPI Data Matched to POI L3ABR30630 002 P	PM0012	Occupational Analysis Program Pa USAFOMC (ATC) Randolph AFB TX	Page	4
D T Tsk Y Nbr	Task Title	306 50			
0012	I 5. Series Circuits	15			!
0013	I 5a. Given 2 schematic drawings of series resistive circuits, solve for 10 specific values in each drawing, with 12 out of 20 correct. STS: 19a Meas: W	(2))) 6 8 8	:
~	Al-1 Do you use metric terms (example mili, kilo, mega) Al-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries Al-6 Do you calculate values of DC voltage, current, resistance, or power Al-9 Do you trace schematic or block diagrams of circuits containing resistors	73 93 4- 45 89			
0014	I 5b. Using a trainer and a multimeter, measure 5 unknown values of voltage/current in a series resistive circuit + or - 5%, with 4 out of 5 correct, with a maximum time of 30 minutes. STS: 18b(2), 7c(1) Meas: P	(3)		4 1 1 4 1	:
B 153 B 156	Bl-1 Do you use the multimeter to measure DC voltage values Bl-4 Do you use the multimeter to measure DC current values	s 97			
0015	I Sc. Given a schematic drawing of a series resistive circuit with theoratical malfunctions, identify the relationship between current, voltage and resistance, with 3 out of 4 correct. SIS: 19b(1) Meas: W	(3)			!
₹	Al-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries	5 6			

PRIMOD	DAFSC 30650 EPI Data Matched to POI L3ABR30630 002	PM0012	Occupational Analysis Program Page 5 USAFOMC (ATC) Randolph AFB TX
D T Tsk Y Nbr	Task Title		30 <i>6</i> 50
0016	I 5d. Using a trainer and a multimeter, identify malfunctioning components and conditions in series resistive circuits, with 4 out of 5 correct, with a time limit of 10 minutes for each problem.	(2)	
A 10	Al-10 Do you troubleshoot circuits to isolate a faulty resistor Al-14 Do you ohm check resistors		84 83
0017	I 7. Parallel Circuits	12	
0018	I 7a. Given 2 schematic drawings of parallel resistive circuits, solve for 10 specified values in each drawing, with 12 out of 20 correct. SIS: 19a	(9)	
9 6 < <	Al-6 Do you calculate values of DC voltage, current, resistance, or power Al-9 Do you trace schematic or block diagrams of circuits containing resistors	sist- ts	45
0019	I 7b. Giver a hematic drawing of a parallel resistive circuit a mecretical malfunctions, identify the relation as between current, voltage and resistance, with 3 out of 4 correct. SIS: 19b(2) Meas: W	(3)	
9 ≺	Al-6 Do you calculate values of DC voltage, current, re ance, or power	resist-	45
0050	I 7c. Using a trainer and a multimeter, identify malfunctioning components and conditions in parallel resistive circuits, with 4 out of 5 correct, with a time limit of 10 minutes for each problem.	(3)	
A 10	Al-10 Do you troubleshoot circuits to isolate a faulty resistor	- 87 -	84

PRIMOD	DAFSC 30650 EPI Data Matched to POI L3ABR30630 002 PM0012	Occupational Analysis Program Page 6 USAFOHC (ATC) Randolph AFB TX
D T Tsk Y Nbr	306 Task Title 50	
A 14	Al-14 Do you ohm check resistors	
0021	I 9. Series-Parallel Circuits	
0022	I 9a. Given a schematic drawing of a series-parallel resistive circuit, solve for 20 specified values, with 12 out of 20 correct. STS: 19b(3) Meas: W	
• •	Al-6 Do you calculate values of DC voltage, current, resistance, or power Al-9 Do you trace schematic or block diagrams of circuits 89 containing resistors	
0023	I 9b. Given a schematic drawing of a series-parallel resistive circuit with theoretical malfunctions, identify the relationships between current, voltage and resistance, with 4 out of 5 correct. STS: 19b(3) Heas: W	
• <	Al-6 Do you calculate values of DC voltage, current, resist- 45 ance, or power	
0024	I 9c. Using a trainer and a multimeter, identify multimeterioning components and conditions in series-parallel resistive circuits, with 4 out of 5 correct, with a time limit of 10 minutes for each problem.	
A 10	Al-10 Do you troubleshoot circuits to isolate a faulty 84 resistor	
A 14	Al-14 Do you ohm c ack resistors 83	
0025	II, AC Circuits	

PRTHOD	DAFSC 30650 EPI Data Matched to POI L3ABR30630 002 PM	PM0012	Occupational Analysis Program Page 7 USAFOMC (ATC) Randolph AFB TX
D T Tsk Y Nbr	Task Title	n LA	306
0056	II 1. AC Circuits	·	
0027	II la. Given a list of terms and a list of definitions concerning alternating current and alternating voltage, match the term with its definition, with 9 out of 12 correct. STS: 19a	(3)	
M ≺	Al-3 Do you use basic AC electrical/electronic terms		56
0028	II lb, Given the period or frequency of an AC signal, calculate the unknown values, with 4 out of 5 correct. STS: 19a Meas: W	(2)	
< < <	Al-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage Al-8 Do you calculate values of frequency, phase relationship, or wave length		45
0029	II 2. Test Equipment	15	
00030	II 2a. Using a signal generator and oscilloscope, adjust the controls necessary to display specified signals on the oscilloscope, t or - 5%, with 3 out of 4 correct, with a time limit of 5 minutes for each signal. SIS: 18a, 18b(1), 18b(5) Heas: P		
B 154 B 157 B 161		s 90 T	94 70 74
B 162 B 163 B 164 B 167	62-2 Do you use the oscilloscope to measure time (rise, fall, pulse width, etc) 62-3 Do you use the oscilloscope to measure AC voltage 62-4 Do you use the oscilloscope to measure DC voltage 62-7 Do you use the oscilloscope to observe signal/data patterns	G	76 86 90 89
		- 68 -	

			USAFOMC (ATC) Randolph AFB TX	
D T 1sk Rbr	Task Title	306 50		
170	82-10 Do you use attenuator probes with oscilloscopes 83-1 Do von use simply menerators (SG) to perform	69		
. ;	operational checks	• (
B 174 B 183	B3-3 Do you use SG to troubleshoot circuits B3-12 Do you use multi-function (square/sine/triangular) signal generators	20 CF CF CF CF CF CF CF CF CF CF CF CF CF C		
0031	II 4. Inductive Reactance			1
0032	II 4a. Given 2 schematic drawings of inductive circuits, solve for 10 specified values in each drawing, with 12 out of 20 correct. STS: 19a Meas: W			1 9 1 1 1
80	Al-8 Do you calculate values of frequency, phase	95		
11	Al-In Do you calibrate or adjust circuits by using	83		
20		29		
21	containing inductors, chokes, or choke colls Al-2l Do you troubleshoot circuits to isolate a faulty	99		
22	ii of	23		
23	Al-23 Do you calculate values of circuit or component inductive reactance	21		
24	Al-24 Do you calculate values of circuit voltage or	26		
76	current in circuits containing inductors	23		
169	B2-9 Do you use the oscilloscope to observe phase	99		
359	relationships F3-1 No von trace block discrams of circuits containing	47		
;	waveshaping circuits (WSC)	:		
360	F3-2 Do you trace schematic diagrams of WSC	46		
367	F3-9 Do you perform tasks on RL differentiating WSC	21		
,	F3-II Do you perform tasks on KL integrating WSC	20		

PRTHOD	DAFSC 30650 EPI Data Matched to POI L3ABR30630 002 PH0012	Occupational Analysis Program Page 9 USAFOMC (ATC) Randolph AFB TX
D T Tsk Y Nbr	Task Title	30 <i>6</i> 50
0034	II 5a. Given 2 schematic drawings of capacitive circuits, solve for 10 specified values in each drawing, with 12 out of 20 correct. SIS: 19a	
8 7	Al-8 Do you calculate values of frequency, phase relationship, or wave length	46 83
72 V	variable resistors A1-27 Do you trace schematic or block diagrams of circuits containing capacitors	85
A 28	Al-28 Do you troubleshoot circuits to isolate a faulty capacitor	83
A 29 A 30	Al-29 Do you calculate values of circuit total capacitance Al-30 Do you calculate values of circuit or component	31 27
A 31	Capacitive rescisione Al-31 Bo you calculate values of circuit or component voltage or current in circuits containing capacitors	31
A 33 F 366 F 368	Al-33 Do you ohm check capacitors F3-8 Do you perform tasks on RC differentiating WSC F3-10 Do you perform tasks on RC integrating WSC	78 24 21
0035	II 6. Filters, Transformers and Relays	
0036	II ba. Given schematic drawings of RC and RL filters, identify the configuration of each, with 3 out of 4 correct. STS: 19a MEAS: W	
A 27 D 292 D 294 E 322	Al-27 Do you trace schematic or block diagrams of circuits containing capacitors D2-5 Do you perform tasks on capacitive power supply filters D2-6 Do you perform tasks on inductive power supply filters D2-7 Do you perform tasks on L-type power supply filters E2-6 Do you perform tasks on low pass frequency sensitive filters E2-7 Do you perform tasks on high pass frequency sensitive filters	66 60 52 34 31 31

PRTMOD	DAFSC 30650 EPI Data Matched to POI L3ABR30630 002 PH0012	Occupational Analysis Program Page 10 USAFOMC (ATC) Randolph AFB TX	
D T Tsk Y Nbr	Task Title	306	
0037	II 6b. Given schematic drawings of RCL filters, identify the configuration of each, with 3 out of 4 correct. STS: 19a Meas: W		
		585	
		35	
E 312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	5.I.	
	current in RCL circuits E2-1 Do you trace schematic or block diagrams of circuits	30	
E 324	containing frequency sensitive filters [2-8 Do you perform tasks on band pass	31	
E 325	requency sensitive filters E2-9 Do you perform tasks on band-reject frequency sensitive filters	22	
0038	II 6c. Using a trainer and test equipment, identify malfunctioning components and conditions in RCL circuits with 3 out of 4 correct, with a time limit of 15 minutes for each problem. 5TS: 19b(3) Meas: P		
A 26	A1-26 Do you ohm chack inductors A1-27 Do you trace schematic or block diagrams of	5.7 8.5	
A 33 A 104	circuits containing capacitors Al-33 Do you ohm check capacitors A3-22 Do you perform tasks on zener diodes	78 69	
E 311	E1-2 Do you troubleshoot RCL circuits to circuit level	33	
E 313	El-4 Do you troubleshoot resonant RCL circuits to	31	
E 318	E2-2 Do you troubleshoot circuits to isolate a faulty fraquency sensitive filter	30	
E 319	E2-3 Do you troubleshoot frequency sensitive filters to circuit level components	28	

PRTHOD	DAFSC 30650 EPI Data Matched to POI L3ABR30630 002 PH0012	Occupational Analysis Program Page 11 USAFOMC (ATC) Randolph AFB TX
D T Tsk Y Nbr	306 Task Title 50	
6200	II 6d. Using a trainer and test equipment, identify the malfunctioning transformer windings and conditions, with 3 out of 4 correct, with a time limit of 10 minutes for each problem. STS: 19c Heas: P	
A 35 A 35 36	Al-15 Do you trace schematic or block diagrams of circuits 79 containing relays Al-35 Do you trace schematic or block diagrams of circuits 80 containing transformers Al-36 Do you troubleshoot circuits to isolate a faulty 77	
A 38 A 40 A 41 A 104	transformer Al-37 Do you calculate transformer voltage or current step-up or step-down ratios Al-38 Do you calculate impedance of transformers Al-40 Do you ohm check transformers Al-41 Do you measure transformer output voltage A3-22 Do you perform tasks on zener diodes	
0040	III. Solid State Devices III. PN Junctions	
0042	III la. Given schematic drawings of limiters with a specified input, identify the output and type limiter with 6 out of 8 correct. STS: 19a Meas: W	
A 83 A 87 A 87 B 37 F 381 F 382 F 383 F 383 F 383	A3-1 Do you trace schematic or block diagrams of circuits containing diodes A3-5 Do you use diode substitution information F4-2 Do you trace schematic diagrams of limiter circuits F4-4 Do you trace schematic diagrams of clamper circuits F4-9 Do you perform tasks on series diode limiter circuits F4-10 Do you perform tasks on shunt diode limiter circuits F4-11 Do you perform tasks on bias limiter circuits F4-12 Do you perform tasks on cener diode circuits F4-12 Do you perform tasks on cener diode circuits F4-15 Do you perform tasks on diode clamper circuits F4-16 Do you perform tasks on diode clamper circuits F4-16 Do you perform tasks on bias clamper circuits	

PRTHOD	DAFSC 30650 EPI Data Matched to POI L3ABR30630 002 PH0012	Occupational Analysis Program Page 12 USAFOMC (ATC) Randolph AFB TX
D T Tsk Y Nbr	306 Task Title 50	
0043	III 1b. Using a trainer and test equipment, determine the malfunctioning components and conditions in limiter circuits with 3 out of 4 correct, with a time limit of 10 minutes for each problem. STS: 19b(3) Meas: P	
A A 85 A 85 A 377 A 378	A3-2 Do you troubleshoot circuits to isolate a faulty diode A3-3 Do you check diodes using an chmmeter A3-6 Do you use diode color codes F4-5 Do you troubleshoot to isolate a faulty limiter circuit F4-6 Do you troubleshoot limiters to circuit level components	
0044	III 3. Transistor Amplifiers	
0045	III 3a. Given schematic drawings of transistor amplifiers, identify the output wave form, function, or operational characteristics, with 9 out of 12 correct. STS: 19a Meas: W	1
A 11	st circuits by using	
A 89	A3-7 Do you trace schematic or block diagrams of circuits 85 containing transistors C1-1 Do you trace block diagrams of circuits containing 69	
C 200	C1-2 Do you trace schematic diagrams of transistor 69 amplifier circuits C1-8 Do you calculate values of transistor amplifier 25	
C 220	C2-3 Do you perform tasks on emitter (swamping) resistor 26 stabilization amplifiers C2-4 Do you perform tasks on self-bias stabilization 25	
C 249 C 251 C 253	amplifiers C5-1 Do you trace block or schematic diagrams of circuits 40 containing operational amplifiers (op amps) C5-3 Do you calculate op amp gain C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting) - 94 -	

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D T TSK Y Nbr	306 Task Title 50	
C 254	C5-6 Do you use or apply operational amplifiers is differential/comparators C5-12 Do you use or apply operational amplifiers for differentiators	
9500	III 3b. Using a trainer and test equipment, identify the malfunctioning components and conditions in a 4-stage transistor amplifier with 6 out of 8 correct, with a time limit of 15 minutes for each problem. STS: 19b(3) Meas: P	
A 33	Al-33 Do you ohm check capacitors A3-8 Do you troubleshoot circuits to isolate a faulty 4.50.0000	
A 91 C 201	Cl-3 Do you check transistors using an ohmmeter 82 Cl-3 Do you troubleshoot to isolate a faulty 68 transistor amplifier	
C 202 C 203	Cl-4 Do you troubleshoot transistor amplifiers to circuit 64 level components Cl-5 Do you troubleshoot transistor amplifier distortion 36 Cl-7 Do you troubleshoot transistor amplifier distortion 36	
	empirizer (crease) correctly connected transistor amplifiers fier stabilization circuits	
C 225 C 226 C 227	to circuit level components C3-1 Do you trace block diagrams of circuits containing coupling circuits C3-2 Do you trace schematic diagrams of coupling circuits C3-3 Do you troubleshoot circuits to isolate a faulty 44	
C 228 C 229 C 230	coupling circuit C3-4 Do you troubleshoot coupling circuits to circuit level components C3-5 Do you perform tasks on direct coupling circuits C3-6 Do you perform tasks on capacitive-resistive coupling 37	40 43 37
C 231	circuits C3-7 Do you perform tasks on capacitive-inductive coupling circuits C3-8 Do you perform tasks on transformer rounling	33 38
	14	

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D T Tsk Y Nbr	306 Task Title 50	
8400	III 5a. Given schematic drawings of unique solid state devices, identify the output wave forms, functions, or operational characteristics, with 6 out of 8 correct. STS: 19a Meas: W	
86 A	A3-16 Do you trace schematic or block diagrams of circuits 54	
	perform tasks on field effect transistors (FET)	
	unijunction transistors (UJT)	
A 104	A3-22 Do you perform tasks on zener diodes A3-27 Do you perform tasks on silicon controlled rectifiers 49	
C 222	(2017) C2-5 Do you perform tasks on thermistor stabilization 26	
1 359	13-1 Do you trace block diagrams of circuits containing wavechaning circuits (WSC)	
F 360	F3-2 Do vou trace schematic diagrams of MSC	
F 363	e WSC	
F 364	Do you perform tasks on sawtooth wave generator WSC	
6500	IV. Basic Circuits	
1		
020	IV 1. Power Supplies	
0051	IV la. Given schematic drawings of a power supply, identify the output waveform at a specified test points, functions, or operational characteristics, with 7 out of 10 correct. STS: 19c Heas: W	1
A 35	Al-35 Do you trace schematic or block diagrams of circuits 80	
D 275	D1-1 Do you trace block diagrams of circuits containing 86	
D 276	power supplies DI-2 Do you trace schematic diagrams of power supply 85	
D 280	olicuits D1-6 Do you perform tasks on half-wave rectifier 67	
D 281	power supplies D1-7 Do you perform tasks on full-wave rectifier 72	
4	power supplies	

power supply filter

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D T Tsk Y Nbr	306 Task Title 50	
D 291		
D 302	ors	
0053	IV 3. Oscillators	
0054	IV 3a. Given schematic drawings of oscillators, identify characteristics and functional operations, with 7 out of 10 correct. STS: 19a Meas: W	
A 20		
A 35	containing inductors, chokes, or choke colls Al-35 Do you trace schematic or block diagrams of circuits 80	
D 286	Containing transformers DI-12 Do you perform tasks on inverters (DC to AC	
F 327	F1-1 Do you trace block diagrams of circuits containing 67 oscillators	
F 328 F 331	FI-2 Do you trace schematic diagrams of oscillator circuits 66 FI-5 Do you align or adjust oscillator circuits 62	
F 332 F 333	circuits rks	
F 334 F 336	F1-8 Do the oscillators you work with use crystals F1-10 Do you perform tasks on series Hartley oscillator 29	
F 337	circuits 11-10 you perform tasks on shunt Martley oscillator 28	
F 338	Fi-12 Do you perform tasks on Colpitts oscillator circuits 26	
0055	IV 3b. Given schematic drawings of non-sinusoidal circuits, identify characteristics and functional operations, with 6 out of 8 correct. STS: 19a Meas: W (5)	
F 347	F2-1 Do you trace block diagrams of circuits containing 64	
F 348	multivibrators F2-2 Do you trace schematic diagrams of multivibrator 63	
F 351 F 353	F2-5 Do you adjust or align multivibrator circuits F2-7 Do the multivibrators you work with use RC networks 43	

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D T Tsk Y Nbr	Task Title	306 50	
F 355	F2-9 Do you perform tasks on astable (free running)	58	
F 356	First state and state that the state of the state for the state for the state for the state of t	63	
F 357	F2-11 by you perform tasks on bistable (flip flop)	9	
F 372	tasks on Schmitt trigger	95	
6 428 6 429	tasks related to tasks related to	51	
0056	V. Logic and Integrated Circuits	! ! ! ! ! !	
0057	V 1. Integrated Circuits	6	
0058			
	definition with 7 out of 10 correct. STS: 19 $f e$ Meas: W (4)	Ĵ.	
6 438	5	16	
G 439 G 440	G1-51 Do you perform tasks on DTL (diode transistor logic) G1-52 Do you perform tasks on TTL (transistor transistor	28	
6 441	logic) G1-53 Do you perform tasks on ECL/CML (emitter coupled or	7	
6 443	current mode logic) G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)	23	
00059	V 1b. Given a schematic drawing of gating curcuits, identify the output waveform at specified test points with 4 out of 5 correct. STS: 19e Meas: W (3	(3)	
95	A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)	74	
A 104 G 412 G 413	A3-22 Do you perform tasks on zener diodes G1-24 Do you trace data flow through logic symbol diagrams G1-25 Do you trace data flow through logic schematic	69 57 57	
6 419	diagrams Gl-31 Do you perform tasks related to AND gates - 99	63 - 63	

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D T Tsk Y Nbr	Task Title	306 50
6 420 6 421 6 422 6 423	G1-32 Do you perform tasks related to OR gates G1-33 Do you perform tasks related to inhibited gates logic functions G1-34 Do you perform tasks related to NAND or NOR gates G1-35 Do you perform tasks related to exclusive OR/NOR logic functions	63 47 62 60
0900	V lc. Using a trainer and test equipment, identify malfunctioning components in integrated circuits; with 4 out of 5 correct, with a time limit of 10 minutes for each problem. STS: 19e Meas: P	
A 96 A 104 G 415	s to isola er diodes systems s	69 69 57
G 416 G 417 G 418	G1-28 Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC G1-29 Do you trace data flow through circuits using positive logic (High = Binary 1) G1-30 Do you trace data flow through circuits using	55 67 68
6 435	negative logic (High = Binary 0) G1-47 Do you develop Boolean equations from logic circuits or diagrams	17
0061	V 3. Logic Circuits	
0062	V 3a. Given schematic drawings of flip-flop circuits, identify functions and operational characteristics with 6 out of 8 correct. STS: 19d Meas: W	
B 161	B2-1 Do you use the oscilloscope to measure time to determine frequency.	74
	binary numbers or convert decimal numbers to binary numbers or called by you perform tasks related to D(Data) flip flops G1-37 Do you perform tasks related to JK flip flops G1-39 Do you perform tasks related to JK flip flops G1-49 Do you perform tasks related to inverters G3-1 Do you trace data flow through circuits containing counters G3-4 Do you perform tasks on UP counters in logic circuits	34 43 40 27 53 54 43

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D T Tsk Y Nbr	Task Title	306 50			
9900	V 6. Soldering	8 0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1	:
900	V 6a. Given a list of hazards of the electronicarent field and a list precautions against thazards, match the precaution to the hazard, 4 out of 5 correct. SIS: 7a, 7c(2) Meas: W	(1)			
9900	V 6b. Given appropriate tools, use correct soldering procedures to remove, replace or repair detail parts.	(9)		1 1 1 1 1 1	1 6 1
A 141 A 142 A 143	tions ctions ormers, board	96 88 81 81			
A 145	you perform high reliability solde	29			
2900	V 6c. Apply safety precaution during soldering operations. STS: 7c(2) Meas: P	(1)		1 1 1 1 1	
	Tasks not referenced for duty A, GENERAL ELECTRONIC/ELECTRICITY				
A 12	Al-12 Do you calculate the value of a resistor required	48			
A 16	Al-16 Do you troubleshoot circuits to isolate a faulty	78			
A 17 A 18	Al-17 Do you adjust relays Al-18 Do you perform tasks on contacts, cores, coils,	41 43			
A 19	armatures, or springs Al-19 Do you continuity check relays Al-25 Do you calibrate or adjust circuits by using variable	58 iable 43			
A 32	inductors Al-32 Do you calibrate or adjust circuits using variable capacitors				
				•	

g.	PRTHOD	DAFSC 30650 EPI Data Matched to POI L3ABR30630 002 PM0012	
Ω - >	Tsk Nbr	Task Title	306 50
<	34	Al-34 Do you use capacitor color codes in your present	23
<	39	Job Al-30 Do you calibrate or adjust circuits using variable	52
<	45		59
<	43	_	27
< <	44	three priss transformer Al-44 bo you adjust three phase transformers A2-1 no you trace schematic or block diagrams of	17
<	95	ng DC motors eshoot circuits to isolate a	23
<	47	DC motor A2-3 Do you troubleshoot DC motor component parts	13
∢ ∢	84 40 40	tri	14 23
<	20	containing AC motors A2-6 Do you troubleshoot circuits to isolate a faulty AC	22
. •	:		:
< <	52 52	A2-/ Do you troubleshoot AC motor component parts A2-8 Do you perform tasks on AC motor component parts	14
4	53	trace schematic or block diagrams of	4
<	54	containing DC generators A2-10 Do you troubleshoot to isolate a faulty DC generator	4
< <	55 56	A2-11 Do you troubleshoot DC generator component parts A2-12 Do you perform tasks on component parts of DC	44
⋖	23	tico	4
<	58	containing AC generators A2-14 Do you troubleshoot circuits to isolate a faulty	4
•	9	AC generator A2-15 Do vou troublactiont AC community conte	M
<	3 9	Do you perform tasks on component parts of	m
<	19	generators A2-17 Do you trace schematic or block diagrams of circuits	8
. <	62	containing alternators A2-18 Do you troubleshoot circuits to isolate a faulty	н
<	63	troubleshoot alternator component p	-
< <	49	Do you perform tasks on component parts on	11 6
٠ -	3 3	aining synchros or servos	
<	3	•	•
< <	67 68	A2-23 Do you troubleshoot synchro or servo component parts A2-24 Do you perform tasks on component parts of synchros	• •
<	69	trace schematic or block diagrams of	8
		containing choppers	

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30 <i>6</i> 50	late a 2	excitation frequency	voltage-current phase	grams of circuits 3	late a faulty 6		ers ransducers	circuits	late a faulty 7			grams of circuits 2/	late a faulty 26			16	esters		ormation	ion Late a faulty 51				displays (LCD)	1/ nsistors		programmable unijunction 7	trolled 12		lateral 6	ry diodes (SRD) 7	FED) 1			L.	on metal oxide varistors (MOV) 7	A	
Task Title	A2-26 Do you troubleshoot circuits to isolate	ly chopper Do you measure chopper coil	coil	A2-29 Do you trace schematic or block diagrams of	containing transducers A2-30 Do you troubleshoot circuits to isolate	transducer	A2-31 Do you callbrate or adjust transducers A2-32 Do vou repair, clean or lubricate transducers	Do you	containing solenoids A2-34 Do vou troubleshoot circuits to isolate a faulty		Do you	A2.36 Do you trace schematic or block diagrams of containing mater movements	A2-37 Do you troubleshoot circuits to isolate a faulty	moter movement	A2-30 DO YOU PETTORM MAINTENANCE ON METER MOVEMENT mechanical parts	A3-4 Do you use diode characteristic curves	Do you check transistors using	Do you use transistor	Do you	A3-15 Do you use IC substitution information A3-17 Do you troubleshoot circuits to isolate	I-state special purpo	Do you perform tasks on	Do you perform tasks on tunnel	perform tasks on		Do you perform tasks on	perform tasks on	transistors (PUT) A3-30 Do vou perform tasks on silicon controlled	(S)	A3-31 Do you perform tasks on silicon unilateral	A3-32 Do vou perform tasks on step recovery diodes	Do you perform tasks on	Do you perform tasks on	Jer diode)	Do you perform tasks	perform tasks	No you trace his	
D T Tsk Y Nbr	A 70	17 A	A 72	A 73	A 74		A 75	77 A	A 78	:	4 79	0 X ¥	A 81		,, 6 4	A 86				/ 66 4 4				A 105	A 108		A 111	A 112		A 113	A 114	A 115				A 118		

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19		14		45
xtend the range of		xtend the range of		measure phase jitters
B 155 BI-3 Do you use the multimeter to extend the range of	voltmeters using external shunts	Bl-6 Do you use the multimeter to ex	ammeters using external shunts	B2-6 Do you use the oscilloscope to measure phase jitters
B 155		B 158		B 166

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		Task Title	A		B2-11 Do you use delay time multipliers with	40		B3-4 Do you use audio sine-wave signal generators	83-5 Do you use audio non-sinusoidal signal generators	B3-6 Do you use	B3-7 Do you use RF greater than 1,000MH sign	B3-8 Do you use white noise signal generators			B3-11 Do you use time mark signal generators		84-1 Do you use frequency counters		B4-3 Do you use field strength testers	B4-5 Do you use digital logic probes	B4-6 Do you use	B4-7 Do you use	84-8 Do you use DC restorers (CRT rejuvinators)			84-11 Do you use logic pulsers	84-12 Do you use logic analyzers	B4-13 Do you use	B4-14 Do you use reflectometers
	T SK	Ā	168		171	173		175	176	177	178	179	180		182	184				189		191					196		198
۵	-	>	€	-	6	6	ı	20	8	~	æ	ø	æ	æ	æ	80	8	æ	æ	6	8	æ	~	æ	6	~	A	2	æ

Tasks not referenced for duty C, AMPLIFIER CIRCUITS

C 204	Cl-6 Do you adjust or align transistor amplifters	38
C 207	C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers	11
C 209	Cl-11 Do you work on paraphase transistor amplifiers	11
C 212	Cl-14 Do you work on wideband transistor amplifiers	28
c 213	Cl-15 Do you work on IF transistor amplifiers	12
C 214	Cl-16 Do you work on RF transistor amplifiers	17
c 215	Cl-17 Do you work on buffer transistor amplifiers	55
c 216	Cl-18 Do you work on complementary symmetry transistor	60
	amplifiers	
C 217	Cl-19 Do you work on DC transistor amplifiers (switching	42
	applications)	
C 223	C2-6 Do you parform tasks on diode stabilization amplifiers	33
C 224	C2-7 Do you perform tasks on double diode stabilization	14
	amplifiers	
C 233	C3-9 Do you perform tasks on optical coupling circuits	6

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amplition circuits (6-5 Do you troubleshoot to isolate a faulty magnetic maplifier (6-6 Do you troubleshoot magnetic amplifiers to circuit level components (6-5 Do you diagram sof circuits containing saturable reactors (6-6 Do you trace schematic diagrams of circuits containing corrector circuits (6-8 Do you troubleshoot to isolate a faulty saturable reactor circuits (6-9 Do you troubleshoot saturable reactors to circuit level components (6-10 Do you dijust saturable reactor circuits or components (6-10 Do you perform tasks on three-phase rectifier power supplies D1-9 Do you perform tasks on three-phase rectifier power supplies D1-11 Do you perform tasks on switching power supplies D1-13 Do you perform tasks on variable resistor power	366 4 3 3 3 3 3 4 60 16 16
	62 53
voltage regulators D3-8 Do you perform tasks on IC power supply voltage regulators T3-9 Do you perform tasks on pulse width modulator	31
m taske	10
Tasks not referenced for duty E, REACTIVE CIRCUITS	
E1-6 Do you calculate phase angle of RCL circuits E1-7 Do you calculate values of power in RCL circuits E2-4 Do you align or adjust frequency sensitive filters E2-5 Do you calculate capacitance or inductance values for	9 10 23 11
y sensitive filters	1

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D T Tsk Y Nbr	Task Title	30 <i>6</i> 50
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Tasks not referenced for duty G, COMPUTERS, DIGITAL CIRCUITS, AND DEVICES	
	conve	12
6 391 6 392	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal G1-4 Do you convert octal numbers to decimal or decimal	19 10
6 393	numbers to octal G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	19
6 394		11
6 395	G1-7 Do you convert base number fractions to another base numbering system	6
6 396	Do you add b	20
G 397 G 398	G1-9 Do you subtract binary numbers G1-10 Do you multiply binary numbers	18 12
	Do you divi	11
6 400 6 401	G1-12 Do you add octal numbers G1-13 Do you subtract octal numbers	~ ~
6 402	Do you add hexadecimal	14 13
	Do you use	14
G 405	G1-17 Do you use gray codes G1-18 Do you use 1740 codes	- 2
	Do you use	4 == 1
807 9	G1-20 Do you use parity bit codes G1-21 Do you use bimnipary codes	12 2
	Do you use	20
6 411	use EBCDI codes	× 13
6 430	-42 Do you perform tasks	31
	(wired "AND" or wired "OK") G1-43 Do vou perform tasks related to buffers	45
6 433	form tasks related	26
6 434	flops G1-46 Do you perform tasks related to complementing flip	26
	•	•
6 436	G1-48 Do you develop logic diagrams from Boolean equations G1-69 Do you cimplify Roolean expressions using Roolean	17 18
	no.	10
2445	Do you perform tasks on	9
	G1-56 Do you perform tasks on positive MOS ICs G1-57 Do you perform tasks on pecative MOS ICs	10
955 9	Do you perform tasks on vertical MOS	`•
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-	Tsk		306
>	Y Nbr	Task Title	20
Ġ	6 484	62-38 Do you perform tasks on fixed winchester type disc	м
		drives	
G	6 485	G2-39 Do you trace block or schematic diagrams of	6
		microprocessor controlled systems	
Ġ	486	62-40 Do you troubleshoot microprocessor controlled	10
		systems to a subassembly or circuit card	
G	285 9	G2-41 Do you troubleshoot microprocessor controlled	•
		systems to isolate a faulty microprocessor	
G	508	63-21 Do you perform tasks on multiplexers	31
O	509	G3-22 Do you perform tasks on demultiplexers	54
G		63-23 Do you perform tasks on comparators	32
G	511	63-24 Do you perform tasks on parity generators or checkers	20
g	512	63-25 Do you perform tasks on code converters	17
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G		G3-27 Do you perform tasks on subtractors	19
G	515	G3-28 Do you perform tasks on count detect circuits	16
G	516	64-1 Do you trace data flow through A/D converters	41
ဖ		64-2 Do you trace data flow through D/A converters	41
G	518	64-3 Do you troubleshoot A/D converter circuits	36
G	519	64-4 Do you troubleshoot D/A converter circuits	36
Ġ	520	64-5 Do the converters you perform tasks on use	m
		flash conversion	
G	521	64-6 Do the converters you perform tasks on use	œ
		successive approximation conversion	
ی	525	64-7 Do the converters you perform tasks on use	M
		ramp conversion	
9	523	64-8 Do the converters you perform tasks on use	м
		R2R conversion	

Tasks not referenced for duty H,
TRANSMISSION/RECEPTION CIRCUITS, DEVICES, AND SYSTEMS

ം ഓ വ	9 17 6	25 13 26	15 14
4 H1-1 Do you measure electrical langth on transmission lines 5 H1-2 Do you measure physical length on transmission lines 6 H1-3 Do you measure standing wave ratio (SWR) on transmission lines	III		3 H1-10 Do you perform tasks on twin lead transmission lines 4 H1-11 Do you perform tasks on flexible coaxial trans- mission lines
Н 524 Н 525 Н 526	Н 527 Н 528 Н 529	Н 530 Н 531 Н 532	Н 533 Н 534

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H2-5 Do you perform tasks on three-cavity klystron

H 546

H 547 H 548

H2-7 Do you perform tasks on traveling wave tube

H2-8 Do you perform tasks on magnetron

655 H

551 552

H2-6 Do you perform tasks on reflex klystron

microwave oscillators and amplifiers microwave oscillators and amplifiers microwave oscillators and amplifiers

H2-4 Do you perform tasks on two-cavity klystron

amplifiers

microwave oscillators and amplifiers microwave oscillators and amplifiers

containing microwave oscillators or amplifiers

coupling hardware components

H 542 H 543 H 544 H 545

assemblies

H 540

H 541

waveguide assembly

H 538 H 539

H 537

Task Title

T Tsk Y Nbr H 535 H 536

lines

microwave oscillator or amplifier

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H3-8 Do you perform tasks on aperture (iris/window)

H4-3 Do you trace block diagrams of AM transmitter

subassemblies or circuits cards subassemblies or circuit cards

H 565

H4-1 Do you use "AH" modulation principles

resonant cavities

H4-2

562 563

H 561

H3-7

III

H3-5 Do you measure frequency of resonant cavities

H3-1 Do you trace schematic or block diagrams of

tuned microwave oscillators and amplifiers

H3-2 Do you troubleshoot circuits to isolate a

faulty resonant cavity

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circuits containing resonant cavities

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Ω 1			č
- >	rsk Pa	Task Title	200
I	566	H4-6 Do you troubleshoot AM transmitters to	м
2	547	subassemblies or circuit cards M4-7 Do one troublechoot AM transmitter subassemblies	~
:		ircuit cards to circuit level components	1
I		Do you align or adjust AM transmitters or	M
I	569	H4-9 Do you calculate percentage of modulation for AM transmitters	-
Ξ	570	H4-10 Do you use "AH" demodulation principles	8
I		H4-11 Do you trace block diagrams of AM receivers	2
I	572	H4-12 Do you trace block diagrams of AM receiver	8
I	573	M4-13 Do you trace schematic diagrams of AM receiver	8
		subassemblies or circuit cards	
I:		you troubleshoot AM receivers	01 0
I	5/5		N
Ξ	576	subassemblies of circuit cards H4-16 Do vou troubleshoot AM receiver subassemblies	7
:		level com	
I		you align or adjust AM receivers or circuits	2
I	578	H4-18 Do you trace block diagrams of single side band (SSB)	8
:			•
	5/3	Heily Do you trace block diagrams of NVB +regermitter eitheremilier of circuit conte	4
Ι	580	trace schematic diagrams	1
:		tter subassemblies or circuit	I
I		Do you troubleshoot SSB transmitters	8
I	582		-
:	,		•
Ï	282	M4-23 Do you troubleshoot 356 transmitter subassembiles or circuit cards to riccuit lavel components	→
Ξ	584		7
I		percentage of modulation for SSB	0
I :	586	H4-20 Do you trace block diagrams of SSB receivers	0 F
•		Journal of Circuit Cards	4
I	588	H4-28 Do you trace schematic diagrams of SSB receiver	1
:		blies or circuit cards	¢
= 3	600	H4-29 Do you troubleshoot 556 receivers to major units	V ~
=		you constant of a section of the constant of t	4
I	591	H4-31 Do you troubleshoot SSB receiver subassemblies	-
		ircuit cards to circuit level comp	
I		Do you alig	-
= :		Do you use "FM" modulation princip	4 \
EI	594	H4-34 Do you trace block diagrams of FM transmitters H4-35 Do you trace block diagrams of EM transmitter	T M
•		semblies or circuit cards)
I	965	H4-36 Do you trace schematic diagrams of FM transmitter	m
(subassemblies or circuit cards	

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	Task Title	H5-l Do you physically align antennas	H5-2 Do you electrically align antennas	H5-3 Do you troubleshoot loading of antennas	H5-4 Do you troubleshoot coupling of antennas	H5-5 Do you plot graph radiation patterns	H5-6 Do you troubleshoot antenna components	H5-7 Do you measure standing wave ratio (SWR) for antennas	H5-8 Do you work with Yagi antennas	H5-9 Do you work with dipole antennas	H5-10 Do you work with slotted antennas	Do you work	H5-12 Do you work with hertz antennas	H5-13 Do you work with marconi antennas	H5-19 Do you work with rhombic antennas	H5-15 Do you work with scimitar antennas	H5-16 Do you work with parabolic antennas	H5-17 Do you work with ground plane antennas	H5-18 Do you perform tasks on rotary antenna arrays	H5-19 Do you perform tasks on stacked (end fire)	antenna arrays	H5-20 Do you perform tasks on broadside antenna arrays	H5-21 Do you perform tasks on cardioid antenna arrays	H5-22 Do you perform tasks on collinear antenna arrays	H5-23 Do you perform tasks on phase antenna arrays	H5-24 Do you perform tasks on planar antenna arrays	H5-25 Do you perform tasks on antennas with	vertical polarization	H5-26 Do you perform tasks on antennas with	horizontal polarization	H5-27 Do you perform tasks on antennas with	circular polarization	H5-28 Do you perform tasks on antennas with	unidirectional radiation patterns	H5-29 Do you perform tasks on antennas with	bidirectional radiation patterns	H5-30 Do you perform tasks on antennas with
T Tsk		H 630	H 631	H 632	H 633	H 634	H 635	H 636	H 637	H 638	H 639	059 H	H 641	H 642	H 643	559 H	H 645	959 H	259 H	H 648		659 H	H 650	Н 651	H 652	H 653	H 654		H 655		Н 656		H 657		H 658		H 659

Tasks not referenced for duty I, RADIO FREQUENCY (RF) MEASUREMENTS OR CALCULATIONS

м	~	~	7	7	~	-
ромег	Il-2 Do you measure RF peak power	Il-3 Do you measure RF average power	Il-4 Do you measure RF effective power	Il-5 Do you measure RF output power using wattmeters	I2-1 Do you calculate RF apparent power	I2-2 Do you calculate RF true power
7	R	7	R	똢		
Il-1 Do you measure RF power	neasure	measure	measure	measure	calculat	calculat
20	700	20	3	70	20	Š
9	9	9	8	8	9	8
-	-5	W.	4	٠,	-	Ņ
11	11	ï	11	11	I2-	I2.
I 660	I 661	I 662	I 663	1 664	I 665	999 I

	306 50	m	, , , , , , , , , , , , , , , , , , ,	19	18 21	111	\ *	ب	12 3	20	ď	01	19	3 8	N	n	м	1	m	2 '				-	0	,	•	• •		•	0	0	
DAFSC 30650 EPI Data Matched to POI L3ABR30630 002 PH0012	Task Title	12-3 Do you calculate RF power loss or gain in db	Tasks not referenced for duty J, ADDITIONAL CIRCUITS, DEVICES, SYSTEMS, OR ITEMS	Jl-I Do you trace block diagrams of circuits		Do you troubleshoot mic	JI-5 Do you work on carbon microphones JI-6 Do you work on capacitor microphones	Do you work on	J1-8 Do you work on dynamic microphones	Do you trac	containing speakers	office the contract of the con	troubleshoot	JI-15 Do you troubleshoot speakers J2-1 Do you trace block diagrams of circuits containing	photosensitive devices	device circuits	J2-3 Do you troubleshoot to isolate a faulty photo-	sensitive device J2-4 Do you adjust or calibrate photosensitive devices	Do you work on ph	Do you work	J2-7 Do you work on phototubes	Do you work	Photovoltaic)	display tubes	J3-2 Do you trace schematic diagrams of display	tubes or circuits	troubleshoot to isolate a faulty display tub	Do y or	Do y 00.	Do you work	J4-1 Do you trace block diagrams of TV systems or subassemblies	J4-2 Do you trace schematic diagrams of TV systems or	component circuits
PRTHOD	D T Tsk Y Nbr	1 667		J 668	699 (J 6/2 J 6/3		J 675	J 677	627	0		J 681		7 995	J 683	J 684			1 688) 689	907	949	169 C		7 692	569 T			769 C	869 F	

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ı			
O T Tsk V Nhr	Tack Title		306
664	14-3 Do vou troubleshoot TV systems to major		
J 700	subassemblies J4-4 Do you troubleshoot TV systems to circuit		•
J 701	level components J4-5 Do you adjust or calibrate TV systems or		•
J 702	components J4-6 Do you trace block diagrams of laser systems		•
J 703	or subassemblies 14-7 Do you trace schematic diagrams of laser systems or commonst rincuite		•
J 704	of computering criticals J4-8 Do you troubleshoot laser systems to major city-recentline		•
J 705	J4-9 Do you coupleshoot laser systems to circuit		•
J 706	1976. Components J4-10 Do you adjust or calibrate laser systems or commonents		0
J 707	J4-11 Do you trace block diagrams of infrared systems or subascombines		7
J 708	J4-12 Do you trace schematic diagrams of infrared systems or commonst circuits		•
907 C	J4-13 Do you troubleshoot infrared systems to major subassemblies		•
J 710	J4-14 Do you troubleshoot infrared systems circuit		•
ווג ר	J4-15 Domposition of Service infrared contents or commonstrated		1
J 712	J4-16 Do you adjust or calibrate infrared systems or components		•